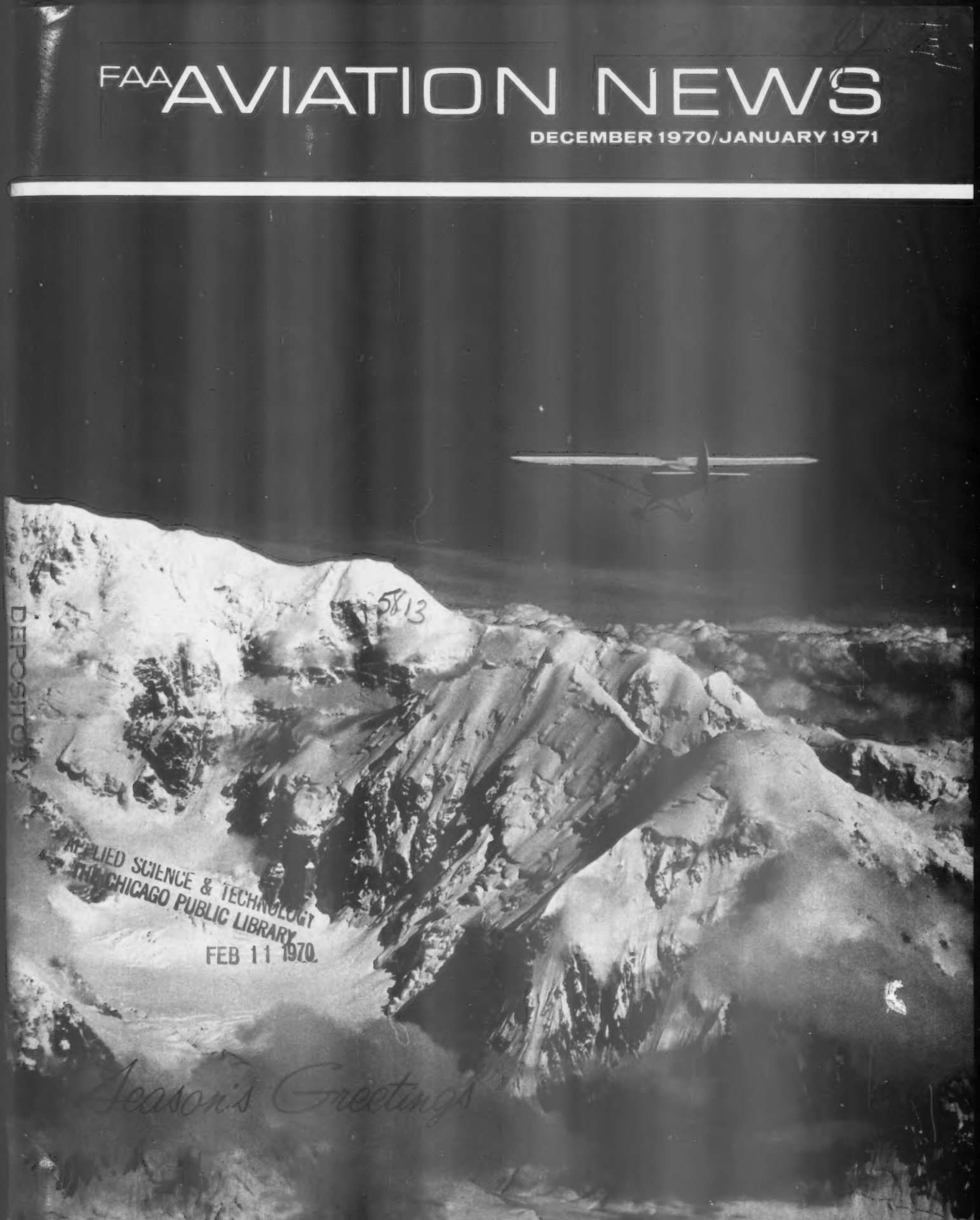
FAA AVIATION NEWS

DECEMBER 1970/JANUARY 1971



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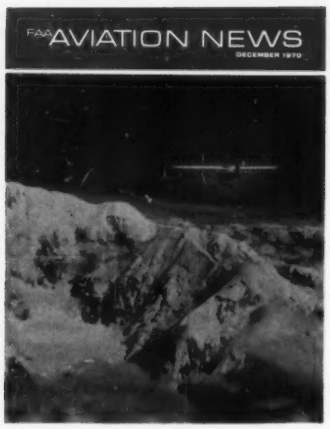

COVER
Winter is not always cruel. For kindly expressions of the season, see pages 4, 12.

FAA AVIATION NEWS

DEPARTMENT OF TRANSPORTATION / FEDERAL AVIATION ADMINISTRATION VOL. 9, NO. 8

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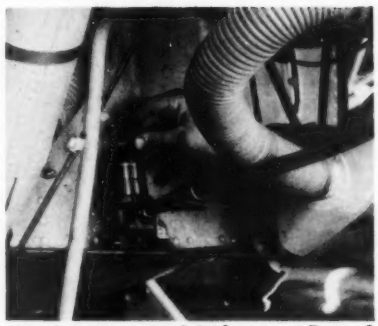
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Where the air is free . . . Page 10

John A. Volpe, *Secretary of Transportation*
John H. Shaffer, *Administrator, FAA*
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The Central Flow Control facility at FAA headquarters in Washington, D.C. Air traffic being controlled by all 21 FAA air route traffic control centers is monitored continuously, and rerouting procedures are placed into effect, when necessary, to prevent overloading of airways and delays in terminal areas.

The Great Leap Forward

The gloomy picture of so-called "crowded skies" and delays at major airports which hung over the air traffic system in the United States only 18 months ago has brightened considerably as a result of recent DOT/FAA steps taken to cope with air traffic. The present outlook shows the air traffic system flowing rather smoothly in all sections of the nation, and plans for the next five years call for a rapid expansion of the system's capacity.

Key steps already taken by the agency include the new recruiting and training program for air traffic controllers, the quota system at high density airports, the Terminal Control Area concept, the new Central Flow Control office and the introduction of area navigation routes.

Controller Training: FAA has filled 6,052 additional positions with ATC specialist trainees over the past year and a half. Since October 1968, the FAA Academy in Oklahoma City has graduated 3,627 air traffic specialists. There has also been an upgrading of grades and pay in the controller ranks, in recognition of the increasing responsibilities inherent in this work. January 1, 1971, will see the start of a program for training 3,000 supervisors and 600 managers a year in the air traffic system. The gap between manpower needs and manpower availability in air traffic is starting to shrink.

Quota System: On June 1, 1969, a quota system for all IFR arrivals and departures was instituted at five of the nation's busiest air carrier airports—Washington National, John F. Kennedy (N.Y.), La Guardia (N.Y.), Newark (N.J.), and O'Hare (Chicago). Since that date, aircraft delays, on the average, at these five airports have been reduced by about 30 percent, while the loss in total operations dropped no more than 5 percent. At J.F.K. where it was not uncommon for aircraft to be held up for several hours a short time ago, delays have now been cut by nearly half. At LaGuardia, they are down by 25 percent.

The quota rule was extended for one year from October 23, 1970, for all designated high density airports except Newark, where quotas have been suspended for an indefinite trial period.

Terminal Control Areas: FAA has introduced—in Atlanta and Chicago—the TCA concept of maintaining ground control over all aircraft planned within the terminal areas of 22 major airport hubs. This concept eliminates the presence of unknown aircraft from busy terminal areas and enables departing and arriving traffic to be handled more swiftly and safely. TCAs are tailored to meet the needs of each locality in which they are used, and they are designed to permit both large and small aircraft to share heavily used airspace.

Central Flow Control: This facility, located at FAA headquarters in Washington, D.C., monitors the flow of controlled air traffic across the entire country. Whenever an imbalance of traffic is observed in one sector or center which might delay traffic flow elsewhere, Central Flow Control can restore the balance betwen system demand and capacity by routing traffic through areas better able to absorb it or by metering the traffic through the affected area.

Area Navigation Routes: Area navigation was introduced into the system in 1969 with the publication of 16 new "off airway" interim routes spanning the country between California and New York. Air Traffic Service is now working out a plan for offering nationwide en route and terminal area navigation routes—including high altitude routes. Pilots flying aircraft with approved area navigational equipment will be able to fly on instruments to virtually any geographical point, avoiding congested areas and gaining a much freer use of the airspace. Previously instrument flight had been possible, in the main, only on a point to point basis between navigation aids.

Over the next five years, FAA will complete a number of important projects which are expected to further extend the capacity of the national airspace system to accommodate more aircraft with greater safety and efficiency. Chief among these is the automating of center and terminal equipment for the transmitting, processing, presentation and analysis of flight data. Automation will turn over to the computer many relatively simple but time-consuming tasks formerly handled by air traffic personnel, affording controllers more time to devote to monitoring and separating traffic. Flight plans and clearances will be delivered much more rapidly. Computerized readout of current flight data on the radar scope will reduce the present communications burden on available radio frequencies. Installation will soon begin on an automated system for conflict prediction. Evaluation of a satellite INS data link communications system will be completed. Radar coverage will be increased to 90 percent for all IFR flights and 100 percent for high altitude flights.

During the same half decade ahead FAA will take decisive steps to increase the number and quality of airports in the United States. With $280 million authorized annually for financial aid to airports (under the recently passed Airport and Airway Development Act), FAA is now in a position to encourage the development of new airport construction and improvement on a long range basis. New standards for the design, construction and operation of airports will mean greater safety for all types of aircraft. Ample consideration for general aviation is assured by the language of the Act which requires that a specific proportion of the matching grants be reserved for small or satellite airports.

The purpose of an Airport Traffic Area by air will be dealt with by provision for V/STOL landing areas within the transportation system. Greater state and local involvement in the Federal airport planning process will be possible because financial aid is now available for airport master planning.

By making certain that the air traffic and airport systems move ahead with a coordinated effort, FAA feels certain that the next five years will usher in a new era of aviation progress. ■

Any Port in a Storm

Winter's boon to a stricken airman may be an ice airfield floating on water.

The maritime adage, "Any port in a storm," has its counterpart in aviation. A pilot who gets into trouble while flying over the northern portions of the United States or Canada during the winter could do worse than set down on one of the literally thousands of unadvertised temporary landing strips provided by nature—frozen lakes.

Ice runways are rarely ideal landing strips, especially for aircraft without skis, or for pilots accustomed to landing aids. There is seldom any hot coffee or other comfort of civilization nearby. But frozen lakes do offer a relatively flat, clear, and perhaps even cushioned surface which can look amazingly good to a hardpressed pilot with a dead engine, dry tanks or a weather problem—when the nearest official landing field is 50 miles away.

The big question, which the pilot may have to answer for himself in a matter of seconds, is whether the lake he has in view is frozen solid enough to sustain the weight of his aircraft. If time is really critical and the airplane is dropping out of the sky, he will just have to take his chances with the best or nearest open stretch he can find. But if he has time to reconnoiter the area below and is aware of what to look for in the way of a suitable body of iced water, he may be able to avoid a winter swim or a battered wing or worse.

The kind of lake to avoid, when there is a choice, is one that is long and narrow, or which looks obviously shallow. Aircraft will sometimes break through ice that appears quite solid because of the *resonance wave*, or vibration, set up during the roll out—especially if a wheels-up landing is attempted and the aircraft slides on its belly for some distance. Shallow or narrow bodies of water appear to be more susceptible than broad lakes or bays to this kind of breakup.

Fresh water ice, incidentally, is much stronger and more dependable than salt water ice. Good solid ice over deep water usually appears dense blue, in contrast to the grayish appearance of thin ice. The colder the weather, the stronger the ice formation—a good reason for knowing what the weather *has* been, as well as the forecast, for the area you will be flying over. Ice at $-25°$F. is about twice as strong as ice at $+25°$F.

The best information you can get about landing conditions on a frozen lake comes from local inhabitants. But if you have to make your own guess, consider (if possible) the conditions under which the lake froze. A quick, early freeze, followed by a heavy insulating snowfall, makes thin ice. A heavy snowfall with high winds signifies the presence of drifts, some of which may be frozen solid and as unforgiving as concrete. Much snowfall followed by a thaw means heavy snow—difficult to plow through with wheel landing gear.

Spring thaws may bring about *spongy* ice, formed by the seepage of ice-melt down through the ice crust. Tell-tale signs of this weak ice are grey-brown bare spots on the lake surface. In the springtime lakes usually begin to rise along the shore, bringing about cracks and general weakening.

How well you can manage to land with wheels on snow depends on the depth of snow and the recent temperature changes. A fairly thick layer of cold powdery snow (above) will give less trouble than a shallow layer of frozen slush (left). Weight and balance are important—you might want to shift a passenger from the front to the back seat in a light plane. It may help you achieve a better nose-high attitude on touchdown.

Large frozen lakes surrounded by hills or heavy woods can be very smooth, but if there is a broad open area exposed to strong winds, the ice freeze-up can produce a very rough surface, later aggravated by drifting snow. A wheel gear aircraft can land without difficulty on ice covered by three to six inches of light snow, provided that the surface is smooth and drifting minimal.

The technique for landing on snow with wheels is similar to landing on wet or muddy fields. Tricycle landing gear aircraft have more difficulty than tailwheel gear, as there is danger of the nose wheel striking a drift. Touchdown should be made at the lowest possible airspeed, with a nose-high altitude maintained by power, as required. The nose wheel should be kept off of the surface as long as possible. Braking on a frozen lake is, of course, virtually nil and probably should be avoided altogether, since the surface is unpredictable and a sudden catching of the brakes could throw too much pressure on the nose wheel. Raising the flaps soon after the touchdown will prevent them from catching on drifts.

With tailwheel aircraft, the rear wheel should touch down with or just before the main gear, and should be held down with the elevators until the aircraft stops.

The approach to a frozen lake landing is usually made with full flaps, to reduce landing speed. A pilot unused to this type of landing may have difficulty gauging his distance to the surface, especially when there is a snow cover. A condition known as *white out*, where the absence of sun results in a complete lack of shadows or detail, occurs frequently in the far northerly areas. Under these circumstances, the pilot may decide to drop some dark object, such as a coat, overboard in order to have a distinct mark to aim at when landing.

For the pilot with retractable landing gear, the apparent depth and density of the snow determines his choice of using his wheels or going in on his belly. Aircraft weight and loading balance also enter into his decision. A lightly-laden aircraft with the center of balance well aft can take a gear-up landing much better than a heavily loaded plane with the center of balance at the forward extreme—the desired nose-high altitude is more difficult to achieve with the latter configuration.

The fixed-gear aircraft pilot has to go in on all threes, regardless of ice or snow conditions. Snow that is heavy, mushy or frozen in drifts are his chief hazards. The wheels can plow through more than a foot of snow if the white stuff is really light and powdery, or freshly fallen, but if it has had time to settle and pack it may jerk the aircraft to a stop like the arresting cable on an aircraft carrier. Tight cinching of the seatbelt and shoulder harness is the order of the day.

Taking off from a frozen lake can be more difficult than landing, but at least the pilot will have had an opportunity to look over the surface and choose his runway. Directional control at the start of the takeoff roll can be a problem, especially on glare ice. The nose wheel will be practically useless for steering under these conditions; it will respond farily well if there are a few inches of snow on the surface. Directional control should be maintained with the rudder as soon as it responds. In any event, the nose wheel (or tail wheel) is brought up from the surface as soon as the elevator becomes effective, and the aircraft is maintained in a nose-high attitude.

As in the soft field takeoff, the objective on ice or snow is to transfer the weight of the aircraft from the wheels to the wings as quickly as possible. Usually at least 25 degrees of flaps are used, to achieve liftoff at minimum speed, although manufacturers' recommendations will vary. These should be consulted for each individual airplane.

When liftoff occurs, the angle of attack should be reduced gradually, with the wheels just clear of surface or drifts until safe climbing speed is attained (the high lift angle will cause the aircraft to start flying at an airspeed close to a stall). If nearby woods or hills are a problem, remember that your aircraft's best *angle-of-climb* will enable you to clear an obstacle with the least amount of forward movement, whereas the best *rate-of-climb* is the airspeed that will bring you to a given altitude in the shortest possible time. Time is more bendable than most obstacles.

Hot tip for cold weather piloting: if necessity or curiosity prompts you to chance a landing on a wide spot in the woods, which you believe or hope is a smoothly frozen lake lightly frosted with snow, make sure you let the nearest ATC facility know about your intentions before settling in. Your impromptu landing field may make a charming picture from the air, but on the surface it may prove to be a radio cone of silence. The call of the wild is not nearly so forlorn as the unheard cry of the lost, downed pilot.

Lewis Gelfan

INSPECTION AIDS 4

Series of articles on maintenance problems of general aviation aircraft.

Cleaning and inspecting the gascolater is one of the maintenance chores open to pilots. Removal of the part is simple, but reinstallation calls for intelligent attention rather than brute strength, especially when the gasket or O-ring has hardened. In that case replace the part.

Straining the Strainer

Ten minutes out of Milwaukee, the pilot of the venerable Cessna 140 was surprised to see the fuel gauge registering half empty. He assumed that the instrument was faulty, having overseen the fueling himself. But he decided not to risk trying to make it in to his destination, St. Paul, and he diverted to Madison, Wisc. Just as he caught a glimpse of the gilded Wisconsin state capitol dome his engine sputtered and died, and the best he could manage was a very rough landing in a frozen and rock-strewn cow pasture. The subsequent repair bill was even rougher—about half the cost of his aircraft. What hurt most of all was the diagnosis of his engine failure: fuel loss, caused by a leaking gascolater, or fuel strainer.

In point of fact, he had noticed a very slight though persistent leakage around the gasket of the strainer, and he assured the FAA GADO inspector who investigated the accident that he had tightened the thumb nut very securely himself.

"How—with your hand, or with a wrench?"

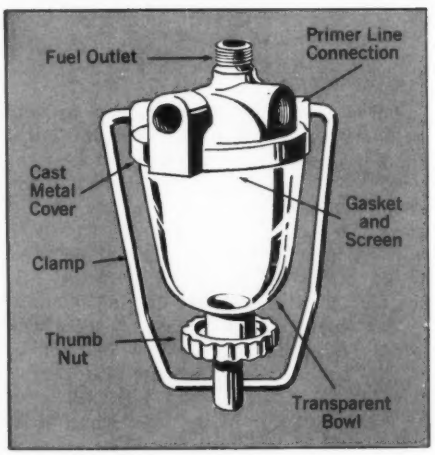
"Well, actually I used pliers."

"Just as bad. The bowl was cracked. You were lucky to get off the ground."

Most modern aircraft engines employ a metal fuel gascolater bowl, with an "O" ring instead of a gasket and a safetied nut to keep the assembly secure (the unit is usually located below the engine on the firewall). Nevertheless, removal and reinstallation of the bowl calls for careful attention: overtightening the fastenings is likely to do more harm than good. The gasket or ring should be replaced if it appears hard or distorted in any way.

For lack of an ounce of cork, an aircraft can be wrecked.

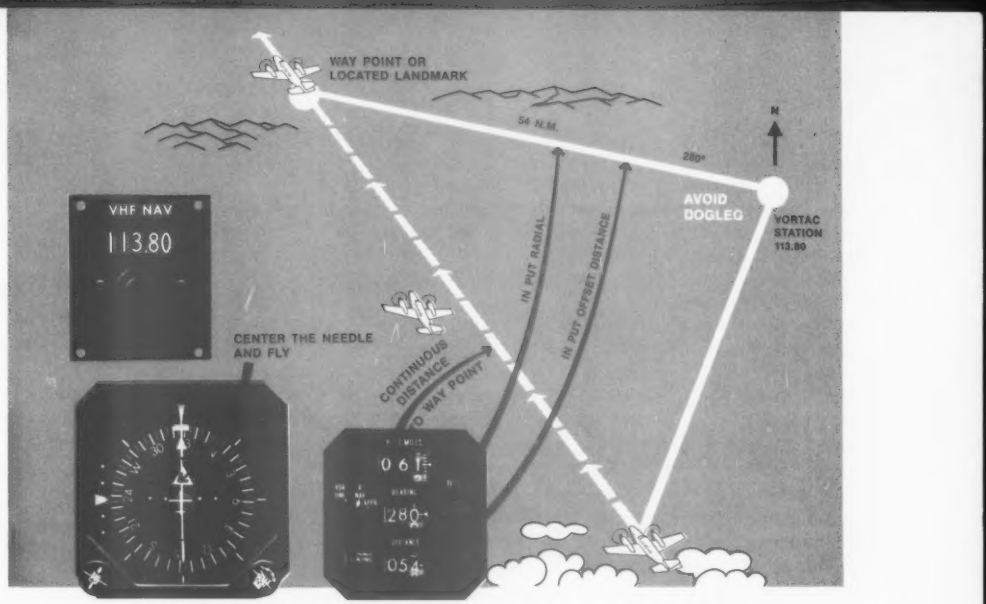
(Based on FAA Inspection Reports on general aviation, available from the Superintendent of Documents, Washington, D.C. 20402. Domestic subscription is $3.00, foreign $3.75.)



Schematic view of gascolater for Cessna 140 shown at left. Basic design is the same in later aircraft, although the thumb nut has been replaced by a nut safetied with wire, and the transparent glass bowl has been replaced by metal. In any case, care must be taken not to crack or deform the bowl by excessive pressure when tightening the nut. Gascolater is a good place to check for water or other foreign matter in the fuel.

as the Crow Flies

New cross-country area/nav routes would reduce air travel time.



Typical area/nav system for general aviation which enables aircraft to fly directly to destination and avoid dogleg to VORTAC station. Computer indicates actual distance to waypoint at all times. At low altitudes some area/nav systems provide course accuracy over 100 miles from VORTAC, under favorable atmospheric conditions.

FAA is proposing to establish four new high altitude IFR area navigation routes across the United States from California to New York. For qualified pilots flying aircraft with approved equipment, the routes would shorten the flying distance between certain major terminals, using existing VORTAC ground equipment.

Two of the new routes are westbound: JFK to Los Angeles and JFK to San Francisco. The eastbound routes serve the same terminals, utilizing different airspace. Area navigation routes are expected to reduce the distance and time required for cross-country flying as well as to relieve traffic on congested airways.

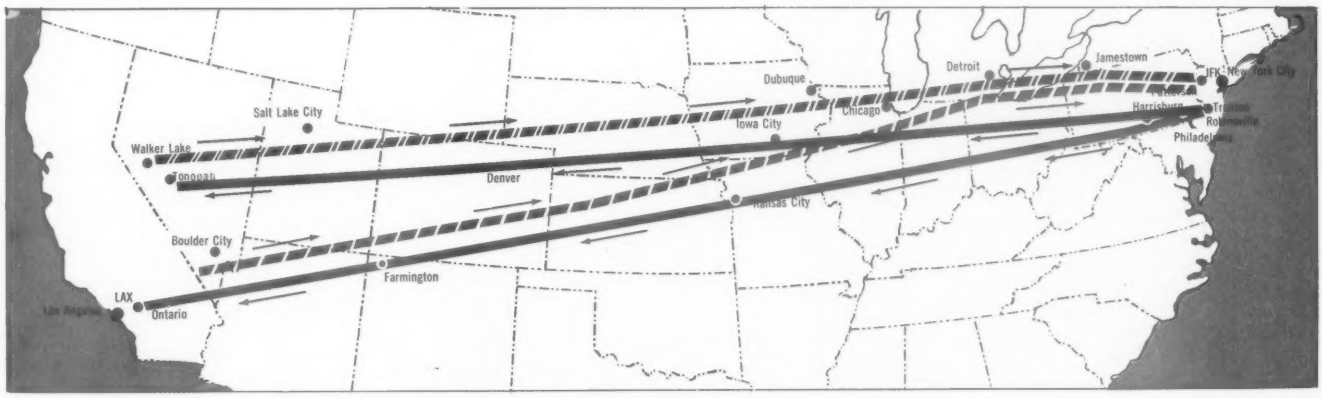
High altitude routes begin at 18,000 feet MSL and extend up to FL 450. Low altitude routes will be located above 1,200 feet and below 18,000 MSL. FAA is planning to establish 180 high alt. area/nav route segments and hopes to see a widespread use made of them. The routes are accessible to all users of the airspace.

For a light aircraft the basic equipment consists of a VOR course indicator (needle gauge), a baring selector, distance (from VOR to waypoint) selector, and a computer to do the calculating. An aircraft-to-waypoint distance indicator is also usually present. Equipment costs begin at about $2,500 for small planes.

Some area navigation routes are published in the Airman's Information Manual. Other routes will be designated in Federal Aviation Regulations and these routes will appear on U.S. Government charts. Waypoints along the routes are identified by latitude and longitude coordinates for self contained systems. The waypoints are also identified by magnetic bearing and distance from the VORTAC facility. When the latter two pieces of information are cranked into the airborne computer, the appropriate frequency tuned, and the course indicator needle kept centered, the aircraft will fly directly to the waypoint.

In VFR weather, area/nav routes (regardless of whether designated as high or low altitude) may be used to good advantage by noninstrument-rated pilots who have the essential equipment on board. The routes are approximately the same width as airways, about four miles either side of the centerline formed by drawing a straight line between waypoints. Aircraft may proceed directly to any of the waypoints along the route as long as they are within effective range of the VORTAC (approximately 50 to 150 miles, depending on altitude and equipment).

Standards and methods for obtaining approval of area/nav equipment are given in FAA Advisory Circular 90-45, available free on request to DOT/FAA Distribution Unit, TAD-484.3, Washington, D.C. 20590.



Area navigation routes begin and end at a VORTAC near (but not on) the terminal airport. With a few exceptions the routes are virtually straight lines, permitting the most direct flight possible.

The 360 Channel COM Ra

FAA's continuing program to increase the number of communications channels available to aircraft and aviation ground facilities has reached the stage where a 360 channel radio is now necessary for unrestricted operation.

The civil aviation radio band (118 to 136 mHz) with 100 kHz spacing has had a maximum of 180 channels. By splitting the spacing down to 50 kHz, except for 121.5 mHz which is still protected by 100 kHz on either side, 358 channels were made available. These additional frequencies were sorely needed to avoid delays in radio communications often experienced at high density airports, or on weekends or holidays, or during bad weather.

Over the past decade FAA has been modernizing its ground communications facilities to provide for 50 kHz channeling The additional channels meant increased safety as well as convenience, since pilots who are unable to contact a control tower, FSS or UNICOM after several efforts often do without the desired information and carry out their operation without full knowledge of weather or traffic conditions.

The frequencies between 118-127 mHz will permit aircraft to obtain the basic VFR services. For access to *all* IFR and VFR services, pilots need radios with 50 kHz spacing from 118 to 136 mHz. The full deployment of 358 channels is shown below:

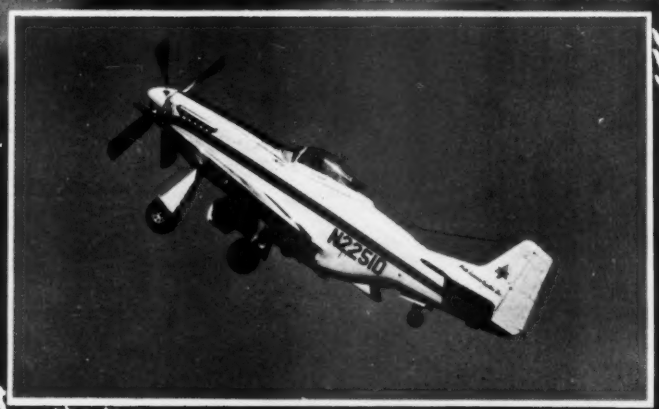
Frequencies	Use	No.
118.0-121.4	Air Traffic Control	69
121.5	Emergency	1
*121.6-121.9	Control Towers	7
121.95	Flight Test	1
122.0-123.05	FSS	22
123.1	Search & Rescue	1
123.15-123.55	Flight Test, Flying School	9
123.6-128.8	Air Traffic Control	105
128.85-132.0	Aeronautical Enroute (Air Carrier)	64
132.05-135.95	Air Traffic Control	79

* May be used for control of certain airport lights by keyed RF signals from aircraft.

Pilots should be aware that full deployment of 50 kHz equipment throughout the national airspace means that aircraft capable of operating only on 100 kHz increments may receive interference from signals on adjacent channels with 50 kHz spacing. Eventually FAA visualizes the use of 720 channels in the same band, with 25 kHz spacing—which means that such interference will become more severe on the less sophisticated equipment.

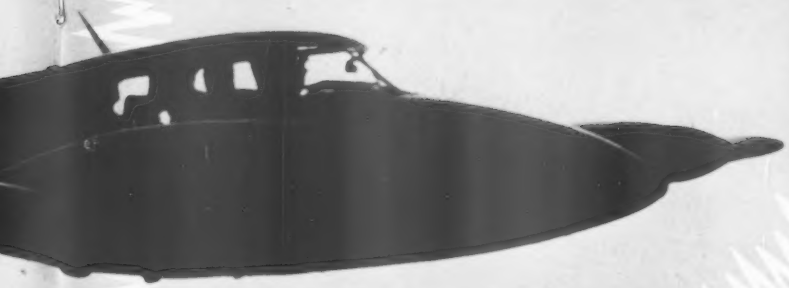
The kind of radio communications equipment any individual pilot needs depends on the scope of his normal flying and the radio services he desires. Given the limited range of the civilian aircraft communications band, and expected continued growth of aviation, the value of giving consideration to at least a 360 channel radio when buying new equipment is self-evident. ■

Air Route Traffic Control Center frequencies are assigned in the band above 121.5 mHz and below 123.65 mHz. Extending FAA radar coverage requires use of more communications channels.



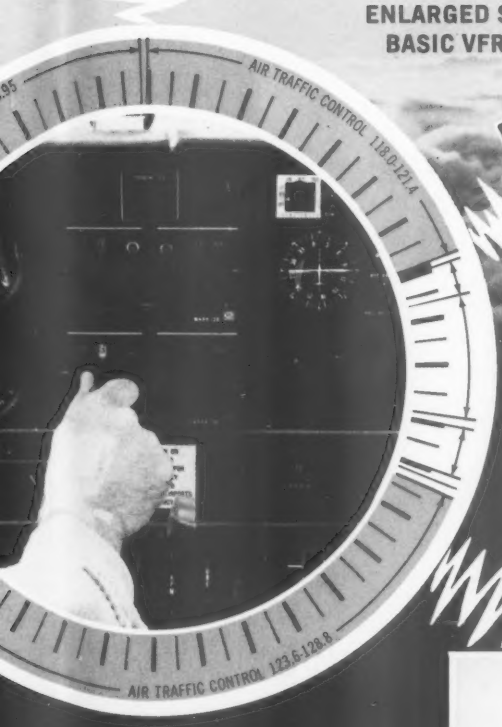
Aircraft undergoing flight tests have exclusive use of frequency 121.9[illegible], also share nine 50 kHz-spaced channels with flying schools.

l Radio



In the radio band from 123.0 to 123.65, flight service stations now have 15 frequencies available for general aviation use.

ENLARGED SEGMENT OF BASIC VFR SERVICES



- EMERGENCY (1 CH.) 100 KHz 121.5
- TOWERS (7 CH.) 121.6-121.9
- FLIGHT SERVICE STATIONS (13 CH.) 122.0-122.75
- UNICOM-MULTICOM (6 CH.) 122.8-123.05
- SEARCH & RESCUE (1 CH.) 123.1
- FLYING SCHOOLS (9 CH.) 123.15-123.55
- FSS AIRPORT ADVISORY (1 CH.) 123.6
- FSS ENROUTE (1 CH.) 123.65

Tower frequencies are found in various sections of the 360 kHz spectrum. Local ATC frequencies (for towers and centers) are shown on lower border of new sectional charts.

FOLLOW that SNARK

A short, not-so-simple flight lesson on controlled airspace, or inner space.

Tangier Island, uninhabited woodland when viewed by Captain John Smith in Colonial days, has recently acquired an airstrip and a reputation as an ideal offbeat flying attraction. Getting there is half the fun, especially when restricted areas are "hot."

"He had bought a large map
representing the sea,
Without the least vestige of land,
And the crew were much pleased
when they found it to be
A map they could understand."

Lewis Carroll—The Hunting of the Snark

Sectional charts for VFR flights are not difficult to understand. But they contain such a wealth of information that many pilots tend to skip over important details during their flight planning. Consequently, they sometimes fly in less than legal weather conditions or stray into restricted or prohibited airspace without ever being aware of their transgression until calamity or censure catches up with them.

Uncontrolled airspace above 1,200 feet is difficult to find now, especially in the heavily settled sections of the country—a fact which surprises many pilots who imagine that as soon as they leave an airport control zone they are free of all restrictions. This is a very naive assumption. To illustrate the point, FAA pilot Don Byers recently made a flight in a Cherokee Six from Baltimore's Friendship Airport to Tangier Island, in the lower Chesapeake Bay—a distance of some 108 statute miles as the crow flies.

In planning the flight, Don's first concern was with the airspace in the immediate vicinity of Friendship Airport. He knows that as soon as he moved out on the runway he would be immersed in both the *Airport Traffic Area* and in the *Airport Control Zone*. Airport Traffic Areas are not indicated on charts; they exist at all tower-controlled airports, forming a circle with a five mile radius from the airport, and extending up to but not including 3,000 feet above the ground.

The purpose of an Airport Traffic Area is to provide the tower with a controlled environment for handling traffic landing at or departing the airport. To assist controllers, all aircraft entering the Area must establish and maintain two-way radio communication. The Area can be transited only by permission from the tower. A speed limit of 180 mph is imposed on piston-powered aircraft and 230 mph on jets or turbo-props.

Friendship's *Airport Control Zone*, which overlaps the Airport Traffic Area, does appear on the chart. It is marked by a ring of "Ts" that outline a five-mile radius, with a rectangular extension to the west. Control Zones extend from the ground upward to infinity, or to the base of the *Continental Control Area*. (The *Continental Control Area* blankets virtually the entire domestic United States beginning at 14,500 feet MSL. Since Don's Cherokee has a gross service ceiling of 14,500 feet, he is not concerned with airspace above that altitude.)

The Control Zone Ring

The ring of "T"s outlining the Control Zone at Friendship is significant: it tells us that fixed wing Special VFR flights are not permitted. Don cannot take off VFR unless the visibility is at least three miles and the ceiling is 1,000 feet or better. If he were departing from an Airport Control Zone marked by dashed lines instead of "T"s (from Dulles International or Philadelphia, for example) he could request control tower approval for a Special VFR clearance that allows him to operate with only one mile visibility and clear of clouds.

Airport Control Zones do not have an airspeed limit but arriving aircraft are subject to speed adjustments for spacing by ATC. The general FAA air traffic control regulation that bans speeds in excess of 250 knots under 10,000 feet MSL applies here.

Don's flight path takes him out of Baltimore on the 150 degree radial of the Friendship VOR. Within a few minutes he is above the 3,000 feet ceiling of the Airport Traffic Area and beyond the five mile boundary of both the Area and the Control Zone. But he is by no means now in uncontrolled airspace.

The moment he passed through the Control Zone boundary he entered a 700 foot floor Transition Area—airspace so designated around all airports which have instrument approach procedures, regardless of whether they have control towers.

VFR weather minimums in a Transition Area are: visibility three miles and clearance of 500 feet under, 1,000 feet over, and 2,000 feet laterally distant from clouds (in uncontrolled airspace, the visibility requirement is only one mile).

The Transition Area around Baltimore includes Martin Marietta Airport, three general aviation airports, and Tipton Army Air Field. Within the area IFR aircraft may be transitioning between airways and airports, and Don is warned by the magenta coloring to be especially alert for aircraft descending or climbing to altitude.

The boundary of the Area is shown by a magenta or reddish coloring with a sharp edge at the outer limit. This outer limit, however, which Don crosses near Pasadena, is only the beginning of the 1,200-foot floor Transition Area shown by the blue boundary. For the purposes of a VFR pilot, the weather restrictions in this Area remain the same, and the ceiling is the same—infinity or the floor of the Continental Control Area. The floor is raised to 1,200 feet.

In many areas of the country, especially in the industrial East, Transition Areas extend over most of the available airspace. Like most VFR pilots, the greater portion of Don's flying will be in this airspace. Except

for the higher weather minimums, it will present no problems to flight nor require any special equipment—not even a radio. But the blue area bounded by red on the chart should remind him that he is flying through an area in which IFR aircraft including air carriers and jets may be vectored from one airway to another, or may be changing altitudes, and he should be on the lookout for them constantly.

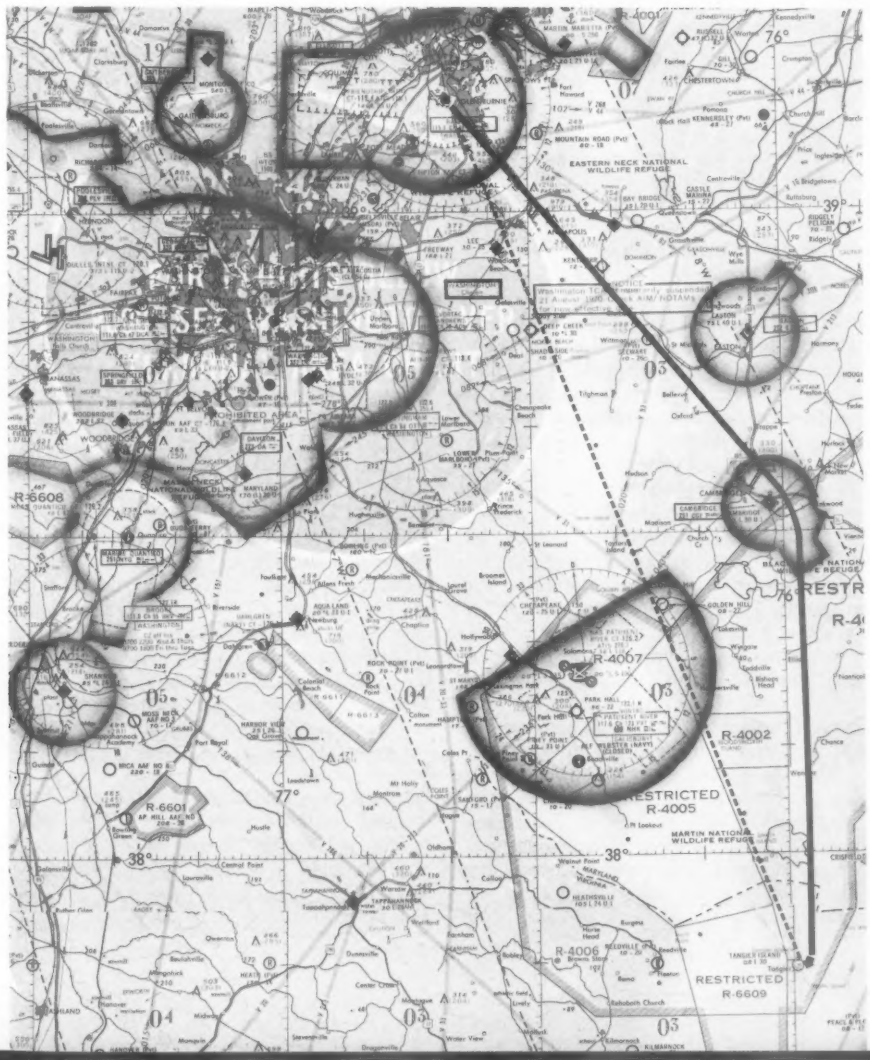
To avoid flying through the Transition Areas, and to enjoy the use of uncontrolled airspace, Don would have had to dip below 1,200 feet. Since much of his course lies over the cold wintry waters of Chesapeake Bay, Don, a nonmember of the Polar Bear Club, preferred to enjoy a little more altitude and flew at 3,500 feet, affording him ample gliding distance to land.

Flying across the Bay, Don successively crossed airways V-16, V-308, V-93 and V-213. The airways, of course, are invisible and involve no change in flight conditions as far as Don is concerned. However, it is a good idea for him to remember that the airway lines shown on the chart indicate only the *centerline* of the airways, which generally extend four miles on either side. It behooves him to be particularly alert in looking out for aircraft when crossing airways, which may be heavily trafficked.

A straight line course from Baltimore to Tangier Island would have called for a magnetic heading of 160 degrees from the VOR, rather than the 150 radial Don chose. Actually he planned a dogleg course by way of Cambridge because the direct course would have taken him through portions of three military restricted airspace zones—R-4007, R-4006, R-4005 and R-4002 and R-4009. Although activity in most of these restricted areas is reported by local air traffic control facilities, the status of R-4002, near Bloodworth Island, potentially active from ground level to 20,000 feet, is available only from military sources.

Furthermore, a telephone call to flight service station before takeoff had informed Don that he would have to check with Salisbury radio when airborne to make sure about the status of the other restricted areas. If any one of them were "hot," he would have to make a wide detour. It was simpler to plan a flight around them. The preplanned dogleg only cost him about seven additional miles, and avoided two long overwater stretches.

Essential information on restricted areas is printed on the lower border of the sectional chart. Current status of the areas for which FAA is listed as appropriate source may be obtained inflight from a flight service station or from the appropriate Center sector shown on the chart. In the Chesapeake area, for example, a scalloped box south of Baltimore tells Don that he may call up Washington Center via their remote station at Clinton for data on nearby restricted areas. Another box in the center of Delaware Bay gives Millville as the site of an air/ground station remoted from the New York Center—which has authority for data on nearby restricted areas. This can save him considerable mike time.



Avoiding "Hot" Areas

After passing over Cambridge, Don called the Salisbury FSS and was told that R-4009 and R-4006 were indeed hot. He was advised to slip the Cherokee down under the 3,500-foot floor of R-4006 and approach Tangier from the east in order to clearly avoid R-6609.

In approaching Cambridge, by the way, Don noted from the magenta coloring on his chart that he was again entering a 700-foot floor Transition Area, surrounding Cambridge Airport, where he observed several aircraft crossing his intended flight path on long final. He altered course to give them a wide berth. If weather forced him to descend beneath controlled airspace now, of course, he would have to fly below 700 feet, until he passed into the airspace bounded by a blue shading.

He delayed turning south for several minutes in order to set a course that would clear both R-4002 and R-6609. Then he descended to 2,500 feet and flew directly to Tangier. Nearing the island he delayed letting down further until he had passed over Martin National Wildlife Refuge, since aircraft were required to stay over 1,000 feet above the refuge. The lower altitude gave him a good view of the island scatters below, with their trim white villages and busy maritime activity—oyster boats and crab boats steaming in and out of the harbor.

Then the Cherokee's wheels crunched onto the gravel of Tangier Island airstrip, signifying a safe and happy ending to a short but not exactly simple flight. Don had passed through half a dozen changing types of controlled airspace, crossed four airways and avoided four or five blocks of restricted airspace as well as a wildlife refuge or two. The gulls wheeling overhead in the salty air probably did not realize how free they were when it came to flying when and where you please.

But then, they did not have the satisfaction of knowing that when you follow the rules, no one gets hurt. ■

Controlled airspace above 1,200 feet is almost everywhere in the northeastern United States, where airways are close together and heavily traveled. To the VFR pilot this means a constant vigilance for aircraft, as well as observance of lower weather minimums than allowed in uncontrolled airspace.

Famous
FLYERS

"First Airborne Navigational Radar"

Airborne navigational radar that will enable a pilot to pick his way through clouds and fog has been a dream of the aviation industry for over a quarter of a century. But no practical means of making radar a workable cockpit tool for blind flying was developed until this year. The invention, an outgrowth of necessity and love, was not made by an expensively equipped research laboratory, but by a fly-by-night bush cargo operator flying out of an isolated airstrip near Point Barrow.

The operator had been flying his cargo run out of the Barrow area for what seemed like hundreds of years, making an infrequent but extended run over the Alaska mainland and Panhandle and down to the lower Forty-Eight. His fleet consisted of one ancient and usually overloaded craft, and his crew was a rustic gang he had picked up locally and taught to fly himself. Normally they were a happy-go-lucky uncomplaining group, but this year they seemed to have been infected by the vapors of discontent rising from colleges and cities and kitchens all over the country. They went on strike.

Their strike manifesto, which began with a solemn declaration on the part of . . . "We, the aircrew of Nick's Flying Service . . .", contained elaborate arguments setting forth the distinction between slave labor and the employment of free spirits, and the rights of employees to refuse to work under conditions which threatened to impair their health, disturb them emotionally, or demean their image. In a word, they were scared.

What frightened them was the barrage of stories appearing in the local press concerning the degree of air pollution that was reported to shroud cities and towns all over the country. Nick's Flying Service was strictly a bush type of operation, used to landing on unmarked, ill-lighted runways, attended (if at all) by sleepy night watchers. The crew was concerned that the smoky, smoggy polluted air would make it impossible to fly their schedule as they had in the past without risking a crash or collision. They would fly IFR or not at all.

Nick told them it was impossible. They did not have the instrumentation and they couldn't possibly be fitted out and approved in time to keep their schedule for this month. If they missed out on their schedule even once, they were out of business. They had heavy first quarter losses to make up. In fact, they should be in the air now, not yakking on the ground—

"No way," the crew said.

Rudy, the spokesman for the other eight, put it bluntly: "Every year you promise to modernize the old bird. But the fact is, nothing's changed in like a hundred years. You're out of it, man. We're the laughing stock of the airways. They're threatening to throw us out of the union, unless we take a stand. This is it. 'IFR all the way, or here we stay.' That's our slogan."

"I'm glad to see you are a poet," Nick told him, "because you're nothing as a flyer. Who needs IFR? I know the territory like the back of my hand."

"But man, they got air out there like you can't *see* the back of your hand."

They argued futilely for half an hour, becoming chilled to the bone on the sleety flight ramp and red in the face, but getting nowhere. Nick was willing to promise anything for next year—a dual com/nav set, with area/nav, artificial horizon, transponder, radar, self-emptying ashtrays—it made no difference. His credibility gap, Rudy informed him, was out of sight. They would not budge without instruments now.

As a last resort Nick suddenly broke into a moist rendition of *Silent Night*. He followed it up swiftly with a throaty *What Child is This?*, and finished with a whispery *Away in a Manger*. It was his best shot. He almost had them eating out of his hand. There was much shuffling of feet and some audible sniffling. But no one followed him into the cockpit. He knew he couldn't handle the operation alone, so he just sat there staring at the crates and crates of cargo piled high in the cabin.

Then his eye fell on a particular box that had fallen partly into the aisle. It contained, as he remembered, a new toy said to be a delight to the young and old alike; it was called *Bat Radar*. Each set contained a specially high-pitched whistle, inaudible to the unaided ear; an earpiece attachment something like a hearing aid but called an *audioformer;* and a "batcap"—a kind of black hood that came down over the eyes. During the game, a player donned the batcap and audioformer and then made his way around a room strewn with chairs, tables, people and other objects, guided by "radar"—that is, he blew continually on the whistle, and the audioformer was intended to inform him, by means of easily recognizable pitch, whenever he approached a solid object. The game was over as soon as a player made physical contact.

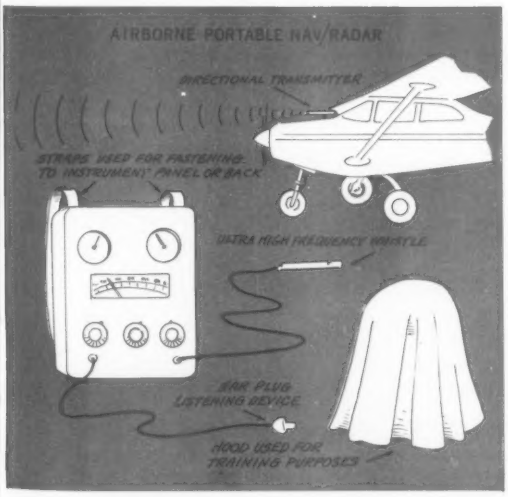
Nick was inspired. He ripped open the box, removed the whistle, batcap and earpiece, and called his crew on board. Excitedly he explained that what they had here was nothing less than airborne radar. As long as he kept blowing on the whistle, there was no danger whatever of colliding with a solid object. Why, no aircraft should be without one.

Observe! He lined the crew up in a staggered formation and, batcap and audioformer in place, he passed back and forth among them, blowing fiercely on his inaudible whistle. When he had moved through the entire ranks without so much as grazing an elbow, a cheer broke out and an impromptu chorus of *Whistle While You Work* was heard.

"All right, boys—places!" Nick cried. "Rudy, rev 'em up Blitz, you help him. Let's go-go—go!"

They were forty minutes behind schedule on takeoff, but fortunately it was the longest night of the year, and they were able to make up the schedule with the help of some daring off-airway navigation over the Great Plains. Everyone on Nick's list got his Christmas package except for one little boy who, sadly enough, is probably still wondering what happened to the *Bat Radar* game he was promised. Nick felt badly about that, of course, but he intends to make up for it next year.

At any rate, it must have been a defective set he borrowed, because the batcap hood had been practically transparent when he demonstrated blind flying, batstyle, to the lads. Which is just as well, because he hadn't been able to hear a sound from that inaudible whistle. MW/LDG


AIRBORNE PORTABLE NAV/RADAR
DIRECTIONAL TRANSMITTER
STRAPS USED FOR FASTENING TO INSTRUMENT PANEL OR BACK
ULTRA HIGH FREQUENCY WHISTLE
EAR PLUG LISTENING DEVICE
HOOD USED FOR TRAINING PURPOSES

Schematic design of airborne navigational radar developed by Nick's Flying Service. High frequency sounds are emitted by a transmitter/resonator and echoes are "heard" as they rebound from objects in the aircraft's path. Blindfold was used in ground trials to simulate blind flying conditions.

■ PUTTING IT ALL TOGETHER. FAA's Office of Flight Standards has issued an addition to the advisory circular on aircraft inspection and repair. Designed primarily for certificated mechanics, AC 43.13-1, "Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair," is also of interest to pilots and aircraft owners. The latest addition, Change 7, touches on metal structures, fabric covering, hardware, corrosion protection, nondestructive testing, aircraft equipment, hydraulic and pneumatic systems, propeller and rotors, engines and fuel systems, and instruments. Change 7 is sold for $3.00 by the Superintendent of Documents, Washington, D.C., 20402.

■ SAVE YOUR EARS. A recent study on cockpit noise by FAA's Office of Aviation Medicine concludes that pilots subjected to the typical noise intensity in either single engine and light twin aircraft for more than three or four hours a week can expect to suffer some irreversible hearing loss within a few years. Recommended solution is the wearing of standard earplugs. Researchers found that earplugs do not interfere with radio or face-to-face communication in the cockpit, and may in fact produce an improvement in speech intelligibility. The reports, AM 68-21 (single engine) and AM 68-25 (light twins) are available on request from DOT/FAA Distribution Unit TAD 484.3, Washington, D.C., 20590. The author, Dr. Jerry V. Tobias, was a co-winner of the 1970 Flight Safety Foundation Award for outstanding publications.

■ WESTERN AVIATION SYMPOSIUM. Aviation leaders from California, Arizona and Nevada have been invited by FAA to attend a two-day Western Aviation System Symposium on January 26-27 at Los Angeles. The agency will brief general aviation, air carrier and military leaders on the current status of the Western Aviation System and FAA's Ten Year Plan.

■ FROM BOTTLE TO THROTTLE eight hours must elapse. A safety rule prohibiting any person from acting as a crewmember of a civil aircraft within eight hours after consuming alcoholic beverages has been adopted by FAA. The eight hour wait is considered an absolute minimum with regard to safe flying. The rule is not intended to relax any stricter company rules (many call for a "dry" period of at least 24 hours) but is aimed at the "small marginal group for whom it is needed.

■ DATA LINK AIR TRAFFIC CONTROL. A new concept in processing and displaying of oceanic air traffic control data, using automatic position reporting via data link and other equipment, is undergoing final tests at FAA's Oakland Center. Properly equipped aircraft using inertial navigating systems with a special VHF transponer have been tracked for about 400 miles offshore. This compares with about 150 miles with standard radar.

Under proposed change, aircraft carrying persons in furtherance of the business of selling anything to those persons would be called a commercial operation, subject to Part 121 or 135.

Clarify Commercial Operator, Raise Charter Standards

FAA is studying comments on a recently proposed two-part rule amending the definition of "commercial operators" of aircraft, and making Part 123 of the Federal Aviation Regulations apply to educational institutions using large aircraft (over 12,500 lbs.).

A commercial operator is currently defined as one who ". . . for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier. . . . When it is doubtful that an operation is for 'compensation or hire' the test applied is whether the carriage by air is merely incidental to the person's other business or is, in itself, a major enterprise for profit."

The proposed change would delete the "doubtful test" statement from the definition and expressly include:

1. Goods or cargo of any kind carried for the aircraft operator for later resale for or by the operator.

2. Persons carried in furtherance of the business of selling to any of them land, goods, or property of any kind; or accommodations at a hotel or similar facility.

Commercial operators must abide by the requirements of FAR 121 or 135 (depending on aircraft weight). Both of these regulations call for more stringent standards of maintenance and operation than FAR Part 91, which covers private operators. The new definition is intended to clarify the intent of the original rule rather than alter policy.

The second change proposed reflects the agency's concern over recent tragic accidents involving large aircraft leased to colleges for transporting athletic teams. The new regulation would also apply to similar groups carried on large leased aircraft—choral groups, student organizations, sportsmen, etc.

Large aircraft operated by such groups would be subject to Part 123 of the Federal Aviation Regulations, which defines the operational and maintenance requirements for large aircraft operated by clubs. These requirements are similar to those specified for regular air carriers.

Retrofitting Turbojets for Noise Reduction Proposed

A regulation that would reduce aircraft noise by acoustically retrofitting the current jet fleet, using "economically reasonable and technologically practicable" means, has been proposed by FAA.

In an Advance Notice of Proposed Rulemaking, FAA is seeking comments from the public on such matters as :

1. The means by which operators should be regulated.

2. Methods of measuring the economic impact of retrofit.

3. Possible division of existing jet aircraft into types for purposes of this regulation.

4. Economic incentives for increasing noise reduction.

Aircraft noise is the single greatest impediment to airport development, according to FAA Administrator John H. Shaffer. The agency has both regulatory (FAR Part 36) and Congressional (Public Law 90-41) authority in the noise control area.

Comments on the advance notice, "Civil Airplane Noise Retrofit Requirements," (Docket No. 10664; Notice No. 70-44) should be submitted in duplicate before January 29, 1971, to FAA Rules Docket, GC-24, 800 Independence Avenue, S.W., Washington, D.C. 20590.

"Keep 'Em High" Policy for Jets Slated for Entire Country Soon

A new program affecting turbojet aircraft as they approach or depart airports will be progressively placed into effect at airports in the United States over a 12-month period. Arriving jets will be kept as high as possible as long as possible. Departing jets will be climbed to highest possible altitude filed by the pilot as soon as possible.

The primary purpose of the new procedures is to increase safety but they are also expected to reduce noise in the vicinity of airports.

The need to keep high-performance jets apart from and above slower aircraft near airports was underscored by FAA's study of near mid-air collisions during 1968 and 1969. The study showed that a high percentage of near mid-airs took place below 8,000 feet and within 30 miles of airports.

Delaying the final descent for landing of jets until relatively close to the terminal and climbing them out as rapidly as possible after takeoff will simplify the "mix" of aircraft in the airport traffic area. It will also remove the source of jet noise as far as practicable from populated areas.

Where operating conditions permit, arriving jets will generally be kept at 10,000 feet or higher until they are within about 30 miles of the airport. They will be kept above 5,000 feet until they reach the final turn-on descent area for final approach.

The new jet procedures will go into effect at FAA's 119 terminal radar control facilities by February 1971. July 1971 is the deadline at the 246 airports with control towers but no radar, and November 1971 is the deadline for non-tower airports with scheduled air carrier service. The "Keep-'Em-High" policy will be extended to all remaining airports serving jet aircraft by February 1972.

DOWN AND OUT. Researchers at FAA's Civil Aeromedical Institute at Oklahoma City study means of speedier, safer passenger evacuation from large aircraft. The hull in use is a C-124, mounted on a special attitude positioner, which can tilt the aircraft under study to various degrees of pitch or bank, simulating emergency conditions which could result in evacuation problems.

• Power to the People

As maintenance officer for a flying club I am frequently questioned on the club's 100-hour aircraft inspection policy.

100-hour inspections have been performed on the club's aircraft for two reasons: (1) I interpret FAR 91.169(b) to apply to our club because most of our club members receive flight instructions in our own aircraft from time to time and (2) I feel it is good general practice to help stay ahead of possible impending major maintenance problems. Is our assumption correct?

Edward W. Michalowski
Tonawanda, New York

Although your reasoning makes good safety sense, the assumption is incorrect.

Because the question you have raised has bothered a number of flying clubs, the FAA amended Part 91 on March 5, 1970, with this problem specifically in mind. The pertinent part of section 91.169(b) now reads as follows: ". . . no person may give flight instructions for hire in an aircraft which that person provides, *unless within the preceding 100-hours of time in service it has received an annual or 100-hour inspection and been approved for return to service. . . ." The requirement is not intended to apply to club aircraft.*

Letters like yours brought about this clarification, so keep asking questions.

• Keeping FAR's Up to Date

I suggest that the latest effective change number for each Part of the Federal Aviation Regulations be included in future Status of FAR's pages. This way I could be sure that I have the latest change for a particular Part.

A. Bentley Hurd
Ravenna, Ohio

Under the present system whereby all FAR Parts are grouped in volumes and sold only as volumes, the changes to individual Parts are contained in the numbered transmittals sent automatically to all subscribers to the FAR volumes. If you as a subscriber have the latest transmittal as indicated in our Status page, you may be certain that you have the latest change for all Parts within the volume.

• Tangling with Towers

In the May 1970 Flight Forum reference is made to new style sectional charts and to newly added terrain clearance height, which I feel could lead to an accident. It is not entirely clear to pilots, that towers, antennae, etc., are NOT included in these elevations.

I feel your own phrase "he knows at a glance that he can clear any terrain" could be misinterpreted with disastrous results. I once experienced an electrical blackout due to generator failure in total IFR conditions with ceiling from 300 to 500 feet. This leads me to think it might be worth changing the elevations on the sectionals to include maximum structure heights plus possible error.

Ernest J. Hills
Lancaster, Pa.

Your recommendation that the maximum structure height plus a safety clearance height be shown has been given consideration but cannot be accepted. Structures such as radio and TV towers are sometimes erected in a very short period of time—less than the six-month life span of a sectional chart. If pilots depended on charts alone for knowledge of man-made structures, lack of current information could be dangerous.

As you know, sectionals show obstructions to air navigation by special symbols, annotated with heights above mean sea level and heights above ground. Any new structures that are built during the six-month charting interval and considered hazards to navigation are listed in Part 3 of the Airman's Information Manual.

• Introductory Flying Instructions

I have six and one-half hours of "$5.00 Introductory Flying Lessons" in single engine airplanes of various manufacturers given by licensed instructors.

Can this time be considered toward private pilot and other ratings?

Don McEachern
Birmingham, Mich.

Any flight time given and signed off in your logbook by a certified flight instructor may be credited toward the flight time required for a private pilot certificate, regardless of the terms upon which it was purchased. We suggest, however, that the time spent in this manner may not have provided instruction as effective as an equal number of hours of planned flight instruction contracted for in the usual manner.

• Towerless Control Zones

What is the correct procedure for aircraft with two-way radio when entering or leaving, crossing, or flying within control zones without control towers?

D. G. Shah
Seneca Falls, N.Y.

A non-tower airport situated within a control zone would not require any different or additional procedures so long as weather conditions are at least basic VFR or better.

When weather conditions are less than basic VFR, flight operations within a control zone must be either in accordance with instrument flight rules or Special VFR regardless of whether or not there is a control tower within the control zone.

• Flashing Strobes

I agree with the statements made by Mr. Mokotoff in the June Forum about the need for flashing strobes at the end of the active runway at large airports.

As a flight instructor I have seen student pilots get very confused at large airports trying to determine which runway is active. No matter how much schooling they receive, experience is the only way they learn. A flashing strobe system would make a lot of pilots breathe easier.

Curtis M. Seale
North Wilkesboro, N.C.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• Cover Location

We have enjoyed reading FAA AVIATION NEWS, but we would like to know WHERE the cover pictures and other scenery pictures are taken. Who knows, we might like to fly there ourselves someday. Specifically, we'd like to know the location of the September 1970 cover picture. Looks like a bit of low flying.

Elsie F. Childs and
Helen L. Dunlop
Helena, Montana

The September cover was shot "somewhere north of Phoenix." The aircraft is not as low as it might appear—about 500 feet above the rocks.

• Bird's Eye View Not Enough

The vertical view of TCA (August 1970 FAA AVIATION NEWS) was very helpful. It is difficult to visualize the area from the plane view alone. I suggest the vertical view be published on all TCA charts in the interest of safety.

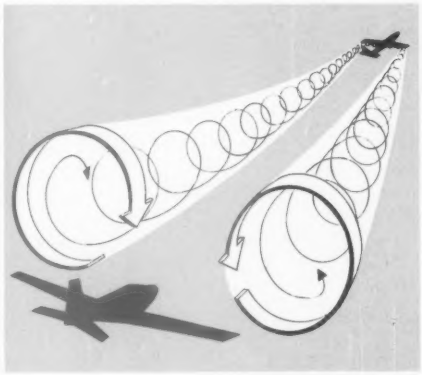
Alden L. Kaschub
Lancaster, Pa.

FAA is considering various methods to improve the portrayal of TCAs, including a vertical perspective, to make them more easily understood by all pilots.

• Color the Wind

In reference to the increasing danger of collisions and accidents from wing tip vortices around high density airports, why not have larger aircraft such as the 747 equipped with colored smoke generators in the wing tips to be used within 3 miles of an airport? This would make them highly visible and show the location of vortices for several minutes.

Walt Pedersen
Sterling, Alaska



Your suggestion for colored smoke marking the vortices is one of the schemes being evaluated by FAA and industry representatives working on the wake turbulence problem. Thank you for submitting it.

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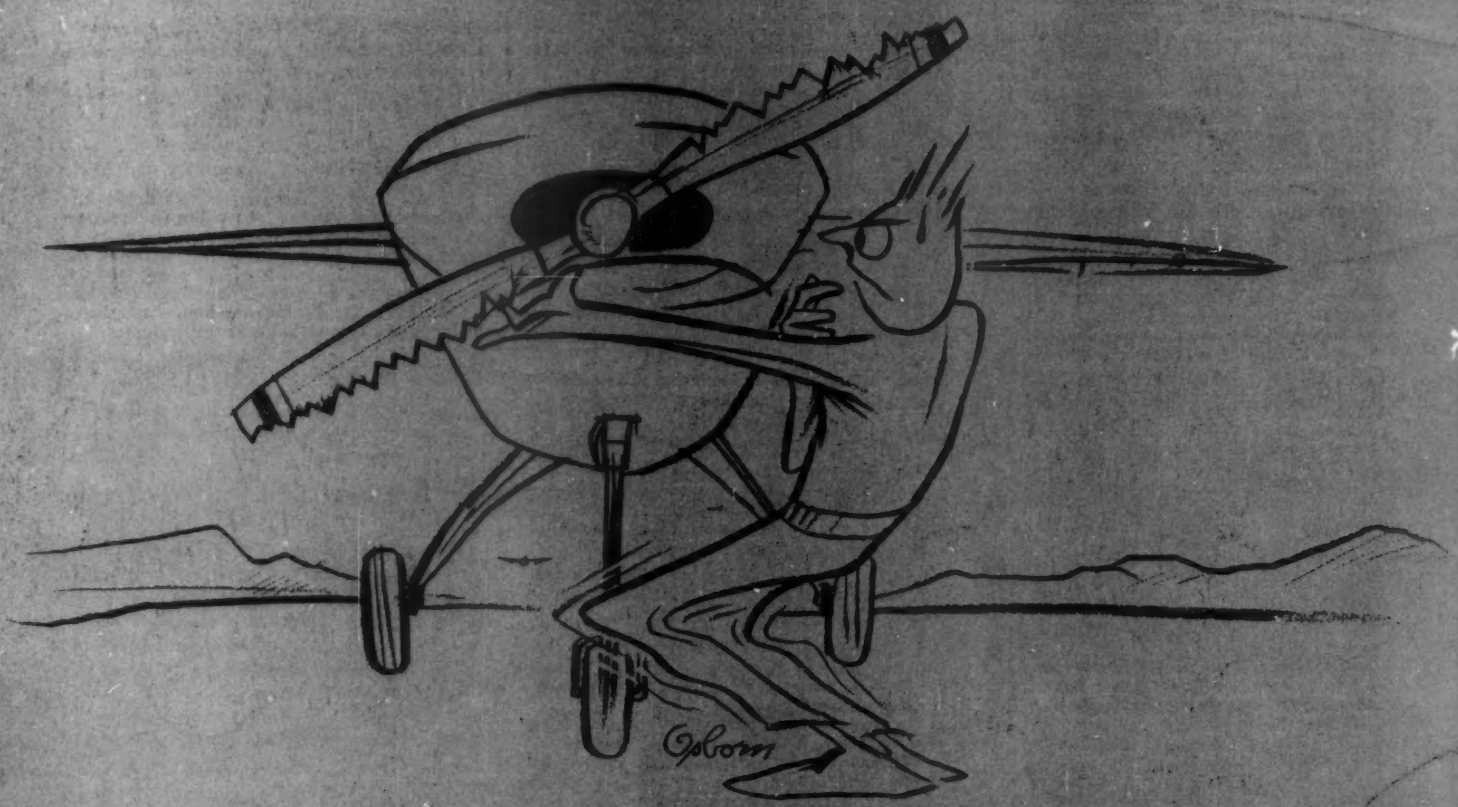

Needs a fix

Suggested by Frank McHugh,
NAFEC